E-TON

SERVICE MANUAL

YUKON ST.

VIPER ST. 50

CONTENTS

1. INFORMATION

2. MAINTENANCE

3. ENGINE REMOVAL AND INSTALLATION

4. ENGINE FUEL SYSTEM

5. ENGINE LUBRICATION AND COOLING SYSTEM

6. ENGINE COMBUSTION SYSTEM

7. TRANSMISSION SYSTEM

8. STEERING SYSTEM

9. FRONT WHEEL SYSTEM

10. REAR WHEEL SYSTEM

11. FENDERS AND EXHAUST PIPE

12. ELECTRICAL SYSTEM

13. TROUBLE SHOOTING

1. INFORMATION

1.1	SAFTY	1.4	SERIAL NUMBER
1.2	NOTES	1.5	TORQUE VALUE
1.3	SPECIFICATION		

1.1 SAFETY

GASOLINE

Gasoline is extremely flammable and is explosive under certain condition.

Do not smoke or allow sparks or flames in your work area.

● CARBON MONOXIDE

Never run the engine in a closed area. The exhaust contains poisonous carbon monoxide gas that may cause loss of consciousness and lead to death.

● BATTERY ELECTROLYTE

The battery electrolyte contains sulfuric acid. Protect your eyes, skin and clothing. If you contact it, flush thoroughly with water and call a doctor if electrolyte gets in your eyes.

● HOT PARTS

Engine and exhaust pipe become very hot and remain hot for one hour after the engine is run. Wear insulated gloves before handling these parts.

● USED ENGINE/GEAR OIL

Used engine oil and gear oil may cause skin disease if repeatedly contact with the skin for long periods.

Keep out of reach of children.

1.2 NOTES

All information, illustrations, directions and specifications included in this publication are base on the latest product information available at the time of approval for printing.

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1.3 SPECIFICATION ENGINE (for Viper$_{ST}$ & Yukon$_{ST}$ in this service manual)

Type	Two cycle air cooled
Displacement	49.3 c.c.
Bore and Stroke	40.0X39.2mm
Compression ratio	6.8:1
Maximum Torque (Nm/rpm)	4.5 Nm/6000rpm
Maximum Power (ps/rpm)	3.8 ps/6000rpm
Carburetor	Piston type
Ignition	Capacitor Discharge
Starting	Electric and kick starter
Lubrication	Forced pressure and wet sump
Transmission	Automatic (C.V.T. V-belt) Fr Neut .Rev

	Viper$_{ST}$ EXL-50	Yukon$_{ST}$ EXL-50
CHASSIS		
Overall Length	1670 mm	1750 mm
Overall Width	940 mm	1010 mm
Overall Height	1040 mm	1065 mm
Seat Height	760 mm	760 mm
Wheel base	1110 mm	1115 mm
Ground Clearance	120 mm	120 mm
Dry Weight	152 kg	152 kg
Fuel Tank Capacity	4.5 Liters	4.5 Liters

	Viper$_{ST}$ EXL-50	Yukon$_{ST}$ EXL-50
SUSPENSION		
Front	Single A-arm / Adjustable Shocks	
Rear	Swing Arm / Adjustable Shock	
BRAKES		
Front	Dual Mechanical drum	
Rear	Hydraulic Disc	
TIRES		
Front	20/6-10	
Rear	20/10-9	
PRESSURE 【psi (0.23 kgf/cm^2)】		
Front	12(0.8)	12(0.8)
Rear	12(0.8)	12(0.8)

COLORING

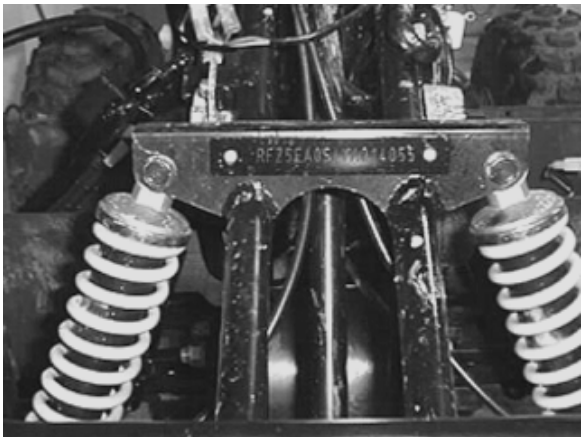
Specifications subject to change without notice.

1.4 SERIAL NUMBER

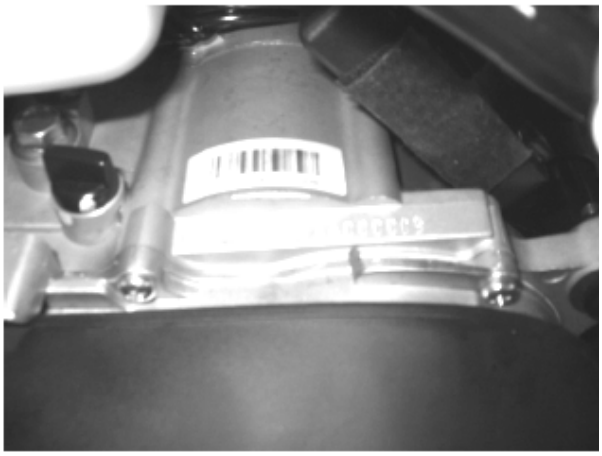
(For Viper$_{ST}$ EXL-50 / Yukon$_{ST}$ EXL-50 in this service manual)

The frame serial number is stamped on the front of the frame.

The engine serial number is stamped on the left side of the crankcase.



Frame serial number



Engine serial number

.5 TORQUE VALUES
(For EXL 50 in this service manual)

STANDARD

● 5 mm bolt and nut	5 N.m (3.5 lbf.ft)
● 6 mm bolt and nut	10 N.m (7.2 lbf.ft)
● 8 mm bolt and nut	22 N.m (16 lbf.ft)
●10 mm bolt and nut	35 N.m (25 lbf.ft)
●12 mm bolt and nut	55 N.m (40 lbf.ft)

ENGINE

● Cylinder head nut	28 N.m (20.7 lbf.ft)
● Spark plug	12 N.m (8.9 lbf.ft)
● Cylinder head bolt	20 N.m (14.8 lbf.ft)
● Alternator bolt	8 N.m (5.9 lbf.ft)

FRAME

● Handlebar upper holder bolt	24 N.m (17.7 lbf.ft)
● Throttle housing cover screw	4 N.m (2.9 lbf.ft)
● Steering shaft nut	50 N.m (36.9 lbf.ft)
● Steering shaft holder bolt	33 N.m (24 lbf.ft)
● Wheel rim bolt	18 N.m (13.3 lbf.ft)
● Tie rod lock nut	35 N.m (25.8 lbf.ft)
● King pin nut	40 N.m (29 lbf.ft)
● Handlebar lower holder nut	40 N.m (29.5 lbf.ft)
● Front wheel bolt	24 N.m (17.7 lbf.ft)
● Front axle castle nut	40-60 N.m (30-45 lbf.ft)
● Front brake arm nut	4 N.m (3.0 lbf.ft)
● Rear brake arm nut	7 N.m (5.2 lbf.ft)
● Rear axle castle nut	40-60 N.m (30-45 lbf.ft)
● Rear wheel bolt	24 N.m (17.7 lbf.ft)
● Exhaust muffler mounting bolt	30 N.m (22.1 lbf.ft)
● Engine hanger bolt	30 N.m (22 lbf.ft)
● Rear axle holder bolt	90 N.m (65 lbf.ft)
● Swing arm pivot nut	90 N.m (65 lbf.ft)
● Rear shock absorber mounting nut	45 N.m (33 lbf.ft)

2. MAINTENANCE

2.1 MAINTENANCE DATA	2.8 IDLE SPEED
2.2 MAINTENANCE SCHEDULE	2.9 DRIVE CHAIN
2.3 FUEL TUBE	2.10 BRAKE SYSTEM
2.4 THROTTLE OPERATION	2.11 WHEELS AND TIRES
2.5 THROTTLE CABLE ADJUSTMENT	2.12 STEERING SYSTEM
2.6 AIR CLEANER	2.13 TOE-IN
2.7 SPARK PLUG	2.14 GEAR OIL

2.1 MAINTENANCE DATA

SPECIFICATION

SPARK PLUG:

SPARK PLUG GAP:	0.6-0.7 mm
RECOMMENDED SPARK PLUGS:	NGK BPR7HS
THROTTLE LEVER FREE PLAY:	5-10 mm
IDLE SPEED:	1800±100 rpm
BRAKE LEVER FREE PLAY:	15-25 mm
DRIVE CHAIN SLACK	10-25 mm
FRONT/REAR TIRE PRESSURE	MIN 2 psi (12.5kpa)
TOE-IN	5±10 mm

TORQUE VALUES

SPARK PLUG	25-30 N.m
TIE-ROD LOCK NUT	35-43 N.m

ENGINE OIL	JASO FC Grade or same degree oil
GEAR LUBRICATION OIL	SAE 90

2.2 MAINTENANCE SCHEDULE

The maintenance internals in the follow table is based upon average riding, conditions. Riding in unusually dusty areas, require more frequent servicing. (For ATV all serial in this service manual)

	INITIAL SERVICE (First week)	REGULAR SERVICE (Every 30 operating days)	EVERY YEAR
FUEL LINE			I
THROTTLE OPERATION	I	I	
AIR CLEANER		C	
SPARK PLUG		I	
CARBURETOR IDLE SPEED	I	I	
DRIVE CHAIN	I, L	I, L	
BRAKE SHOE WEAR			I
BRAKE SYSTEM	I	I	
NUT, BOLT, FASTENER	I	I	
WHEEL	I	I	
STEERING SYSTEM			I
SUSPENSION SYSTEM			I
C.V.T. AIR FILTER		C	
GEAR OIL			R
REVERSE GEAR OIL-RXL90R			R

Note – I: Inspect and Clean, Adjust, Lubricate or Replace, if necessary
C: Clean L: Lubricate R: Replace

2.3 FUEL TUBE

Inspect the fuel lines for deterioration, damage or leakage and replace if necessary.

2.4 THROTTLE OPERATION

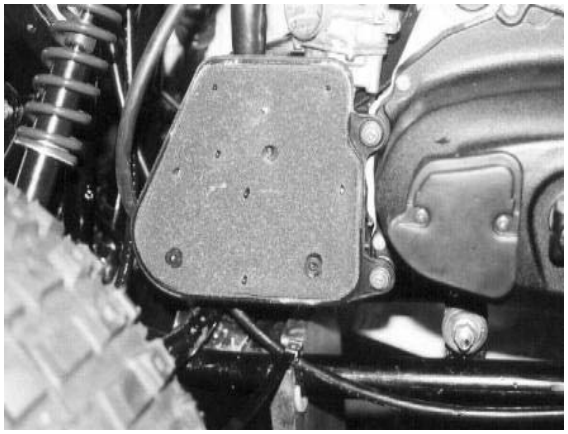
Inspect for smooth throttle lever full opening and automatic full closing in all steering positions.
Inspect if there is no deterioration, damage or kinking in the throttle cable, replace it if necessary.
Check the throttle lever, free play is 5-10 mm at the tip of the throttle lever.
Disconnect the throttle cable at the upper end.
Lubricate the cable with commercially lubricant to prevent premature wear.

2.5 THROTTLE CABLE ADJUSTMENT

Slide the rubber cap of the adjuster off the throttle Housing, loosen the lock nut and adjust the free play of the throttle lever by turning the adjuster on the throttle housing. Inspect the free play of the throttle lever.

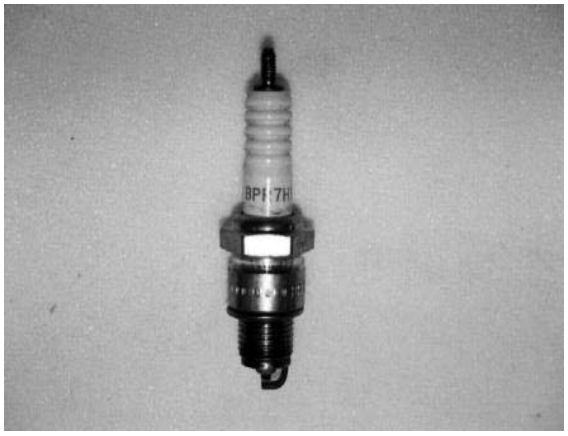
2.6 AIR CLEANER

Unscrew the air cleaner cover screws.
Pull out the air filter element from the air cleaner case.
Wash the element in non-flammable solvent, squeeze out the solvent thoroughly.
Let it dry.
Soak the filter element in gear oil and then squeeze out the excess oil.
Install the element into air cleaner carefully.



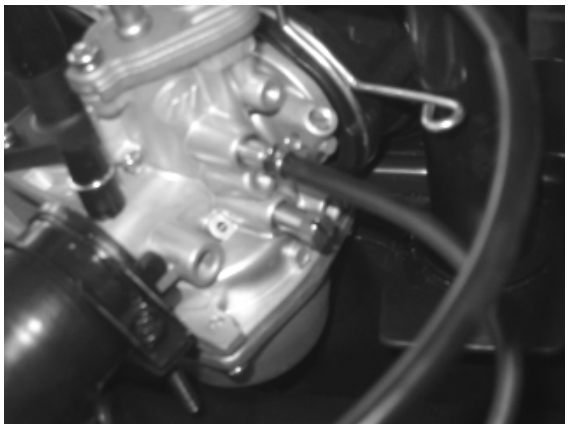
2.7 SPARK PLUG

This spark plug located at the front of the engine.
Disconnect the spark plug cap and unscrew the spark plug.
Check the spark plug electrodes for wearness.
Change a new spark plug if the electrodes and insulator tip appear unusually fouled or burned.
Discard the spark plug if there is apparent wear or if the insulator is cracked or chipped.
The spark plug gap shall keep in 0.6-0.7mm.
With the sealing washer attached, thread the spark plug in by hand to prevent cross threading.
Tighten the spark plug with 25-30 N.m



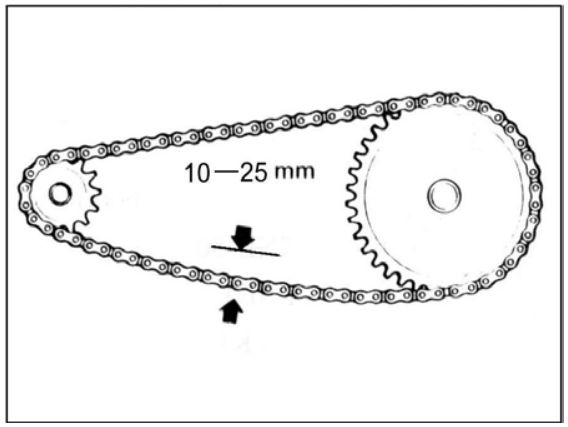
2.8 IDLE SPEED

Connect an engine speed meter.
Warm up the engine, 10 minutes are enough.
Turn the idle-speed adjust screw on the carburetor to obtain the idle speed. "Turn in" (clockwise) will get higher speed. "Turn out" (counter clockwise) will get lower speed.
IDLE SPEED: 1800±100 rpm

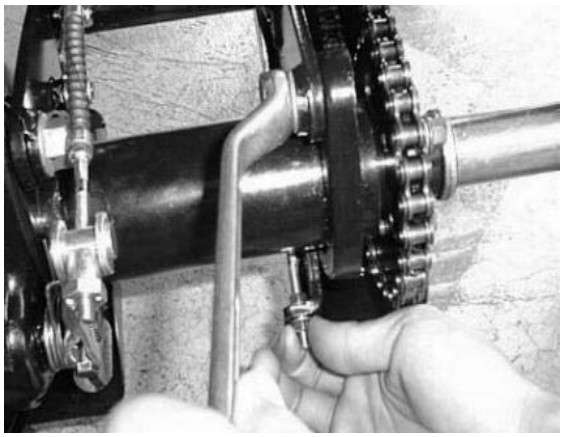


2.9 DRIVE CHAIN

Inspect the chain slack. The standard is 10-25mm.



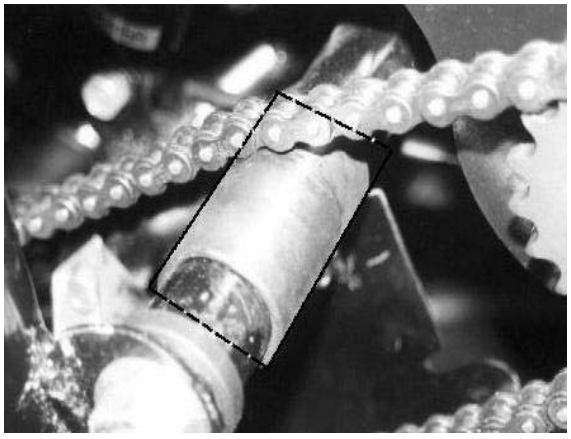
Adjust the chain slack.
Loose the lock bolts (4 pcs) then adjust the drive chain slack by turn the adjusting nut.
Tighten the four lock bolts.



When the drive chain becomes very dirty, it should be removed, cleaned and lubricated by specify lubricator. Using commercial chain lubricant to lubricate the drive chain.
Clean the drive chain with kerosene and wipe it dry.
Inspect the drive chain for possible wear or damage.
Replace the chain, if it is worn excessively or damaged.

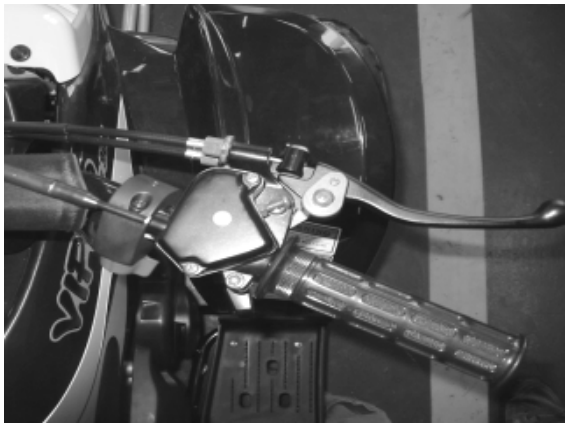
Inspect the sprocket teeth, if it is excessive wear or damage, replace it.

Inspect the chain-tensioned roller.
Replace it, if necessary.



2.10 BRAKE SYSTEM

Inspect the front brake lever and cable for excessive play or other damage.
Replace or repair if necessary.
Measure the free play of the brake lever at the end of the brake lever. The standard of free play is 15-25 mm.

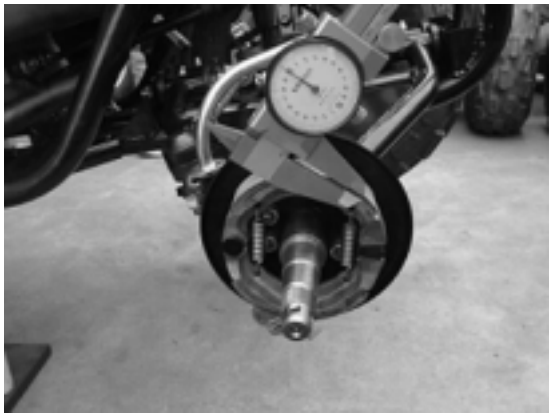


Inspect the rear brake lever and cable for excessive play or other damage.
Replace or repair if necessary.
Measure the free play of the rear brake lever at the end of the lever. The standard is 15-25 mm.

BRAKE SHOE WEAR

FRONT BRAKE

Release the front wheel and inspect the brake lining thickness.
Service Limit: 2.0mm(0.08 inch)
If either lining is worn beyond the service limit, replace Both brakes shoes.



2.11 WHEELS AND TIRES

Inspect the tire surfaces for cuts, nails or other sharp objects.
Check the tire surfaces at cold tire condition.
The standard of tire pressure is 1.2±0.3 psi.
(0.8 kgf/cm^2)

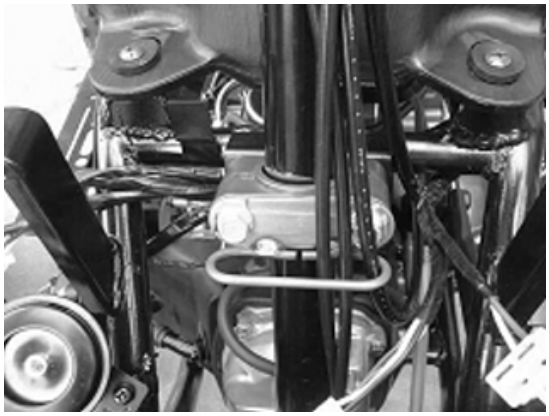
2.12 STEERING SYSTEM

Check the free play of the steering shaft with the front wheels, turned straight ahead.
When there is excessive play, inspect the tie-rod, kingpin bushing and ball joint.

STEERING SHAFT HOLDER BUSHING

Remove the front fender first.

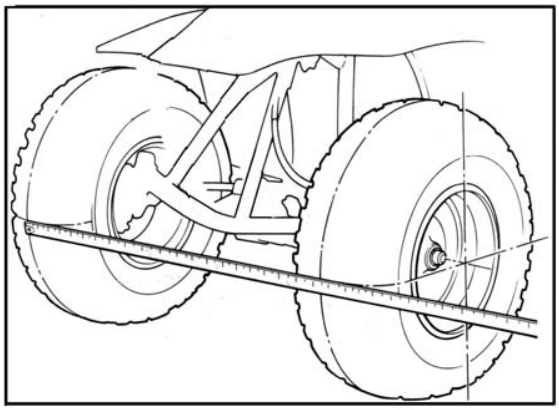
Remove the steering shaft holder and check the steering shaft bushing for wears or damage.
If the bushing is worn or damaged, change a new one.
Grease the steering shaft bushing and install the parts in the reverse order of removal.



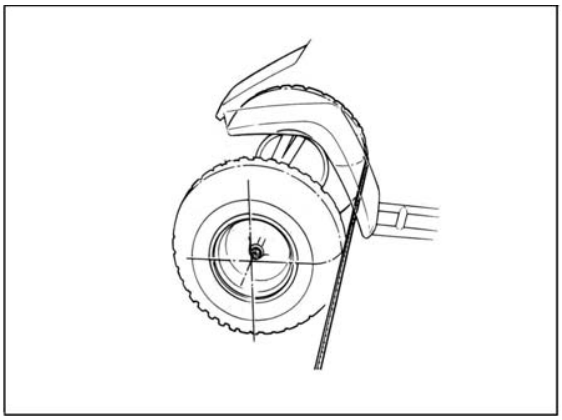
Torque: steering shaft holder bolt: 33 N.m (24 lbf.ft)

2.13 TOE-IN

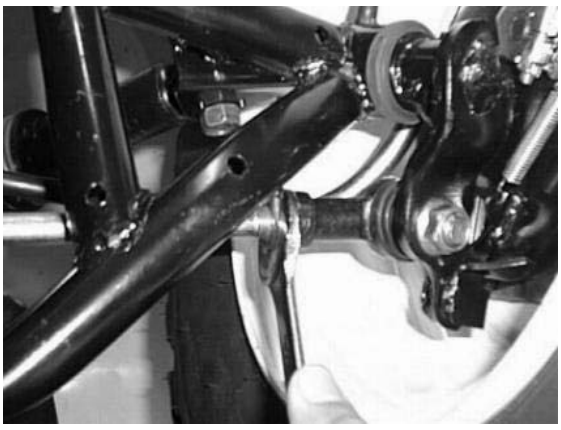
Let the vehicle on level ground and the front wheels facing straight ahead.
Mark the centers of the tires to indicate the axle center height.
Measure the distance between the marks.



Carefully move the vehicle back, let the wheels have turned 180 °, so the marks on the tires are aligned with the axle center height.
Measure the distance between the marks.
Calculate the difference in the front and rear measurements.
Toe-in: 5±10mm



If the toe-in is out of standard, adjust it by changing the length of the tie-rods equally by turning the tie-rod while holding the ball joint.
Tighten the lock nuts.
Torque: 35-43 N.m



2.14 GEAR OIL

Gear oil needs to be changed every year.
There is a gear oil release bolt at the rear of engine.
Unscrew this release bolt and can let the dirty oil flow out.
The re-add oil hole is on the engine case beside gearbox.

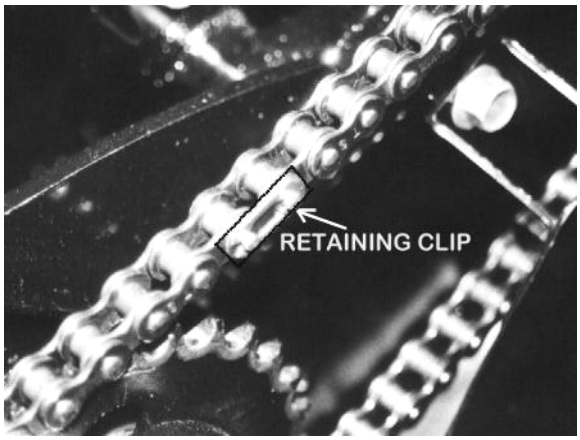
3. ENGINE REMOVAL AND INSTALLATION

3.1 SERVICE INFORMATION
3.2 ENGINE REMOVAL
3.3 ENGINE INSTALLATION

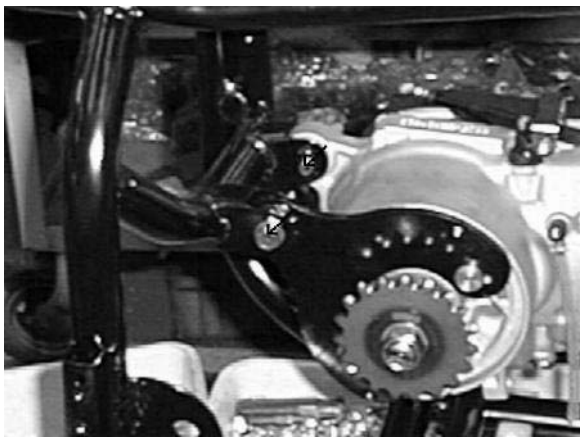
3.1 ENGINE SHALL BE REMOVED IN THE CONDITIONS OF NECESSARY REPAIRMENT OR ADJUSTMENT TO THE TRANSMISSION AND COMBUSTION SYSTEM ONLY

3.2 ENGINE REMOVAL

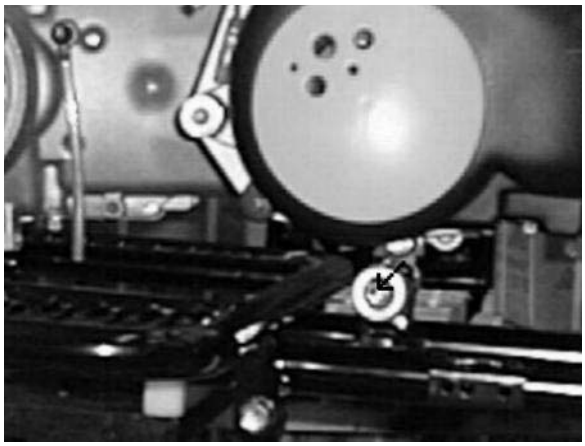
Remove the seat and rear fender. (Chapter 11) Remove the spark plug cap from the spark plug. Remove the exhaust pipe.
Disconnect the carburetor cable by unscrew two screws on top of the carburetor.
Take off oil pump cable from the oil pump control plate. Oil pump is under the right side of engine.



Disconnect the wire connectors. There are three connectors for carburetor auto-choke, starter motor and generator respectively.
Remove the drive chain cover. This is under the chain.
Remove the drive chain retaining clip and master link, and remove the drive chain.



Remove the three engine hanger nuts and bolts.
Remove the engine from the right side of frame.



3.3 ENGINE INSTALLATION

Engine installation is essentially the reverse order of removal.
The torque of engine hanger bolt is 24-30 Nm
Route the wires and cable in reverse order properly.

POORLY	★ UNPROPER ADJUSTMENT TO THE IDLE SPEED SCREW ★ IGNITION MALFUNCTION ★ FUEL/AIR MIXTURE RATIO NO GOOD ★ AIR CLEANER DIRTY ★ INSULATOR LEAKS ★ FUEL TANK CAP BREATHING HOLE CLOGGED
LEAN MIXTURE	★ FUEL JET OF CARBURETOR CLOGGED ★ FUEL TANK CAP BREATHING HOLE CLOGGED ★ FUEL FILTER CLOGGED ★ FUEL FLOWS IN THE TUBE UNSMOOTHLY ★ FLOAT LEVEL IN CARBURETOR TOO LOW
RICH MIXTURE	★ FLOAT NEEDLE VALVE IN CARBURETOR FAULTY ★ FLOAT LEVEL TOO HIGH ★ AIR DUCT IN CARBURETOR IS CLOGGED ★ AIR CLEANER DIRTY

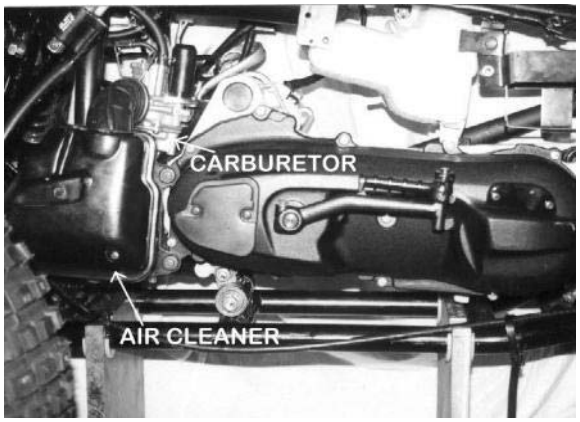
4. ENGINE FUEL SYSTEM

4.1 FUEL TANK 4.2 CARBURETOR

4.1 FUEL TANK

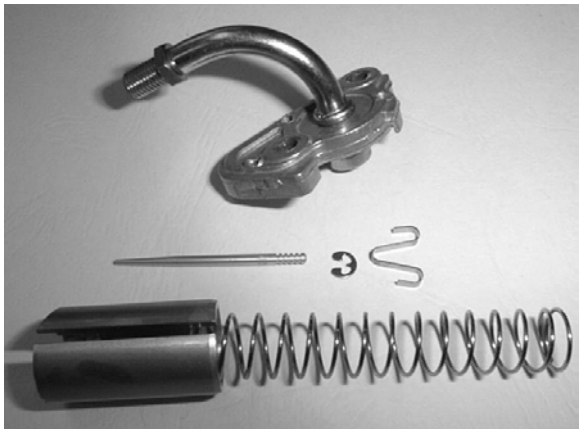
REMOVAL
Remove the seat and rear fender.
Disconnect the fuel line from the carburetor.
Remove the fuel tank cap and front fender.
Unscrew the fuel tank fixed bolts.
Note: Keep gasoline away from flames or sparks.
Wipe up spilled gasoline at once.

4.2 CARBURETOR



REMOVAL
Remove the air cleaner.
Disconnect the fuel line and auto-choke electric wire.
Unscrew the intake pipe mounting bolts at the carburetor then removes the carburetor.
Note: Turn fuel cup on (off) position

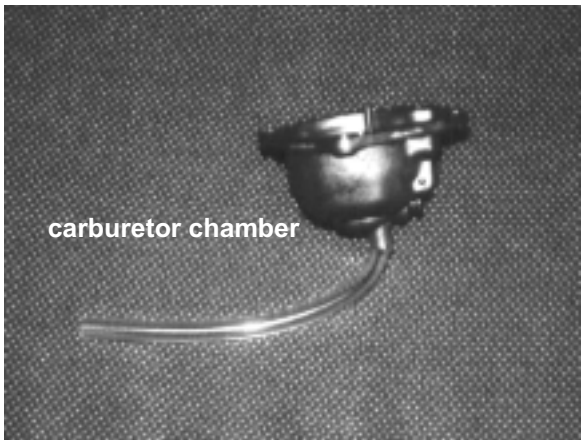
Remove the carburetor cap.
Remove the throttle cable from the throttle valve while depressing the throttle valve spring.



Remove the needle clip retainer, the jet needle and needle clip. Inspect the throttle valve and jet needle surface for wearness, scratches or dirt.

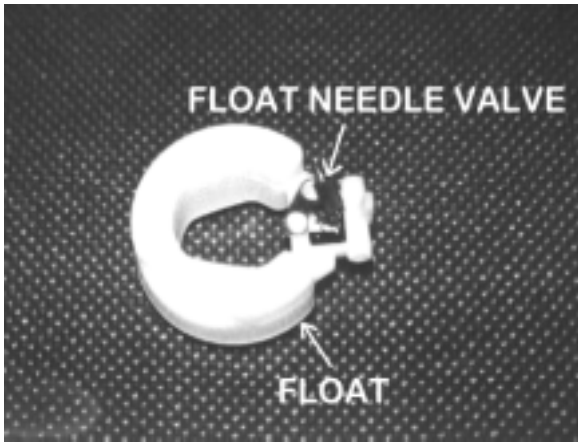
DISASSEMBLY

Unscrew the float chamber screws and remove the carburetor chamber.



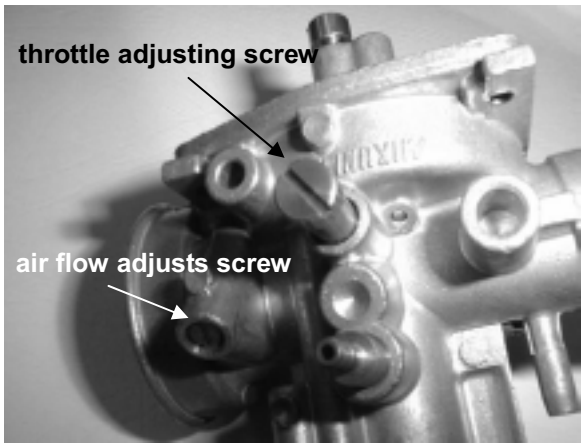
Disassembly the float and float needle valve.

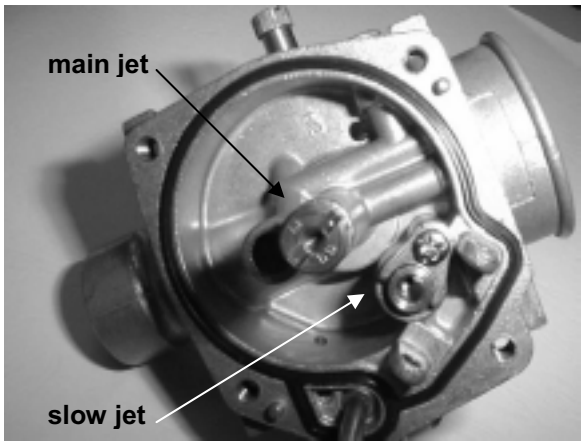
Inspect the seat of the float needle valve for wear or damage.



Disassembly the slow jet, main jet, throttle adjusting screw and air flow adjusts screw.

Inspect all the jets and screws for wear or damage. Clear the passages and jets with compressed air.





ASSEMBLY

Clean all parts in solvent and blow it dry with compressed air.
Assembly is essentially the reverse order of disassembly.

THROTTLE VALVE ASSEMBLY

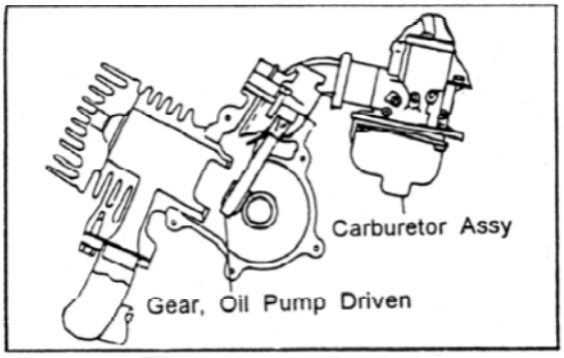
Install the needle clip on the jet needle.
Install the jet needle into the throttle valve.
Assembly the throttle cable, spring and the throttle valve.
Align the throttle valve groove with the idle speed adjust screw and install the carburetor cap to the carburetor.

5. ENGINE LUBRICATION AND COOLING SYSTEM

5.1 ENGINE LUBRICATION SYSTEM	5.4 COOLING SYSTEM
5.2 CAUTION	5.5 TROUBLESHOOTING
5.3 OIL PUMP	

5.1 ENGINE LUBRICATION SYSTEM

The engine drives the pump gears of oil pump crankshaft. Pump gears rotate the plunger shaft in oil pump. This shaft sent the lubricating oil into the crankcase to mix with the mixture of air-fuel flow evenly.
The oil drops and foam cover the cylinder inner wall, piston surface and piston rings.



5.2 CAUTION

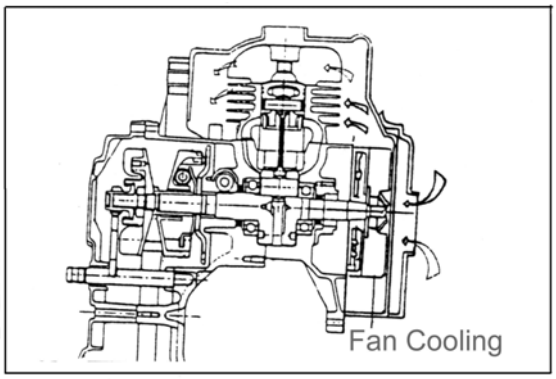
Having enough oil supply to engine is very important.
If the oil quantity is not enough, this engine will be serious scratched, and then this engine will stop, even cannot work again.
When this engine is serious scratched, you need to change the piston, piston rings and cylinder together.
Also you need to check the combustion system and lubrication system carefully.

5.3 OIL PUMP

The quantity of oil that deliver out from oil pump increased by the engine speed and the carburetor throttle open width. Oil pump is under the right side of the engine and connected by a control cable of throttle.

5.4 COOLING SYSTEM

The engine-cooling fan sucks the air.
The cooling fan is on the right side of engine.
The air is forced to flow through cylinder fin and cylinder head. So, the cylinder and piston will not over heat.



5.5 TROUBLESHOOTING

NO ENOUGH OIL SUPPLY TO ENGINE	★	**THE OIL LEVEL IN OIL TANK IS TOO LOW.**
	★	**OIL TUBES WERE NOT FIXED WELL.**
	★	**OIL HAS LEAKAGED FROM TUBE ENDS.**
	★	**OIL TUBES WERE BROKEN.**
	★	**OIL TUBES WERE CLOGGED.**
	★	**OIL PUMP CANNOT WORK.**
ALWAYS INSUFFICIENT OIL LEVEL IN LUBRICATE OIL TANK	★	**EXTERNAL OIL LEAKS**
	★	**WORN CYLINDE HEAD GASKET**
	★	**WORN PISTON RINGS**

6. ENGINE COMBUSTION SYSTEM

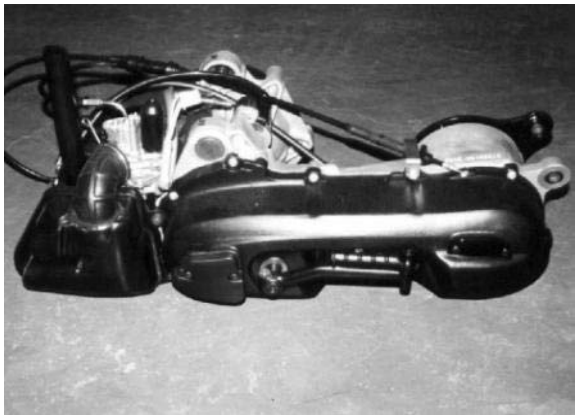
11.1 TROUBLESHOOTING	11.3 CYLINDER AND PISTON INSPECTION
11.2 CYLINDER AND PISTON REMOVAL	11.4 INSTALLATION

6.1 TROUBLESHOOTING

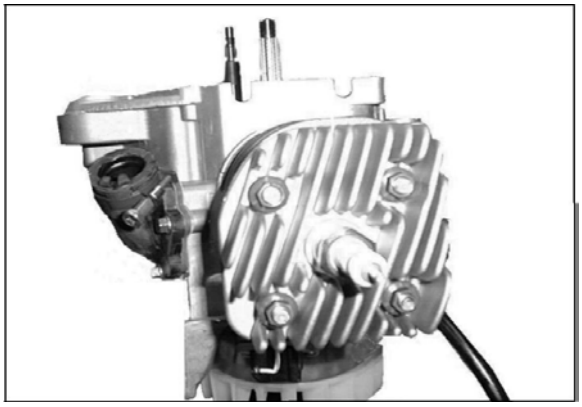
LOW COMPRESSION	★ CYLINDER HEAD HEAD GASKET LEAKING OR DAMAGED WARPED OR CRACKED CYLINDER HEAD
	★ CYLINDER OR PISTON RINGS WORN OUT
HIGH COMPRESSION	★ EXCESSSIVE CARBON BUILD-UP ON PISTON HEAD OR IN COMBUSTION CHAMBER
EXCESSIVE NOISE	★ PISTON AND CYLINDER WORN OUT
	★ EXCESSIVE CARBON BUILD-UP
EXCESS SMOKE	★ CYLINDER OR PISTON RINGS WORN OUT
	★ IMPROPER INSTALLATION OF PISTON RINGS
	★ PISTON OR CYLINDER WALL SCORED OR SCRATCHED
OVERHEATING	★ EXCESSIVE CARBON BUILD-UP ON THE PISTON OR COMBUSTION CHAMBER
	★ ENGINE COOLING SYSTEM (FAN, CYLINDER COVER…) WORKS BADLY.
	★ OIL SUPPLY IS OUT OF ORDER.
	★ WRONG IGNITION TIMING

6.2 CYLINDER AND PISTON REMOVAL

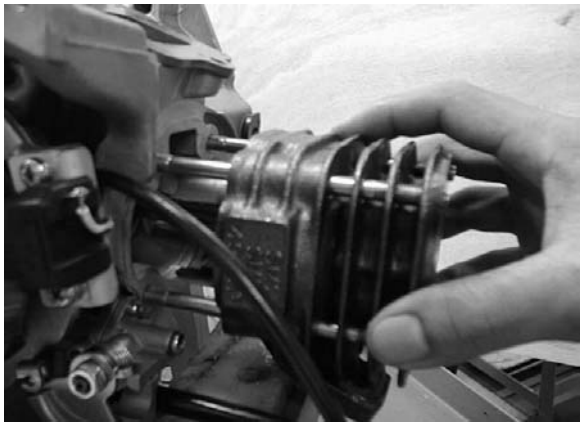
Remove the seat and rear fender.
Remove the exhaust pipe.
Remove the spark plug cap.
Disconnect the wire.
Drag out the engine.
Disassembly the air cleaner and carburetor.



Remove the intake pipe mounting bolts.
Remove the cylinder bolt nuts.

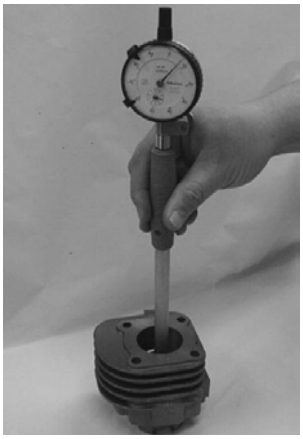


Remove the cylinder head.
Remove the cylinder carefully, then you can see the whole piston.
Remove one piston pin clip.
Remove the piston and piston pin.
Spread each piston ring and remove it by lifting up at a point just opposite the gap.
Note: Don't let the clip drop into engine crankcase.

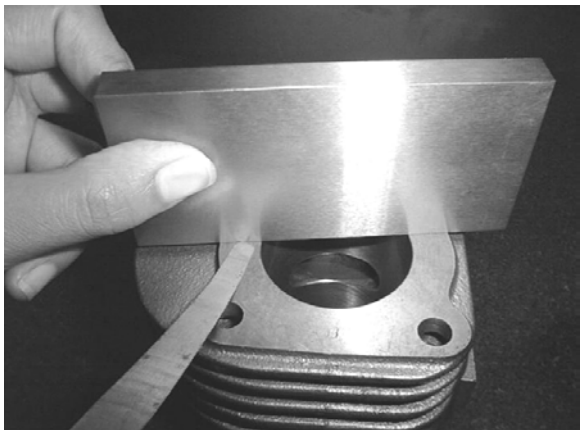


6.3 CYLINDER AND PISTON INSPECTION

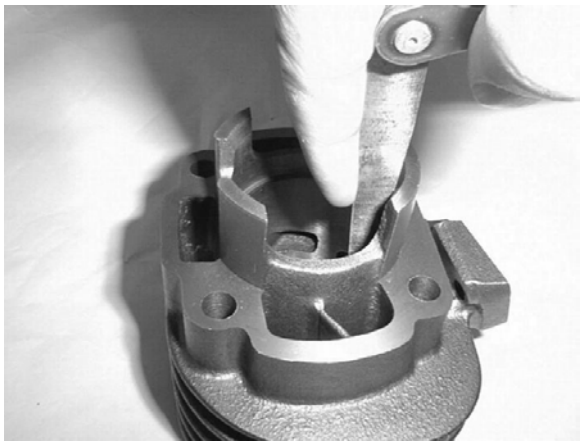
Inspect the cylinder bore for wear or damage.
Measure the cylinder inner diameter at three levels in X and Y-axis.
Taper limit: 0.10 mm
Out of round: 0.10 mm



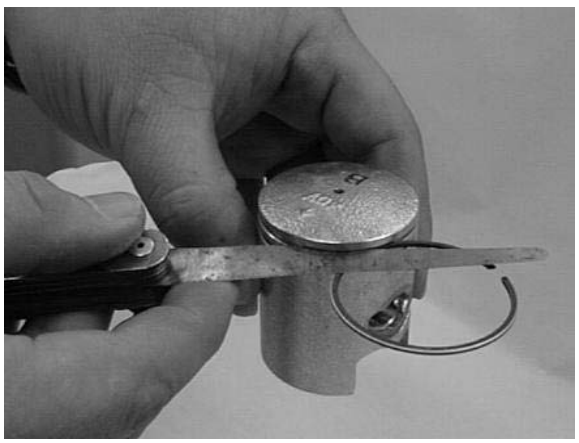
Check the cylinder head mating surface for warp with a straight edge and feeler gauge.
Service limit: 0.10 mm



Insert each piston ring into the cylinder, and measure the end gap.
Service limit: 0.5 mm



Measure the clearance between ring and groove.
Service limit: 0.09 mm

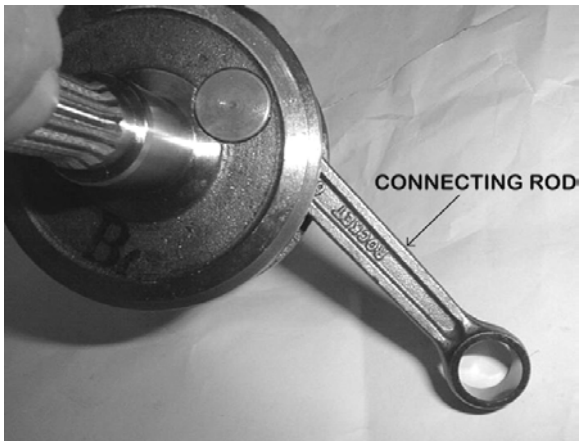


Measure the piston outer diameter at 10 mm high from the skirt's bottom.
Service limit: 39.9 mm

Measure the piston pin bore, and the piston pin outer diameter.
Pin outer diameter service limit: 9.96 mm

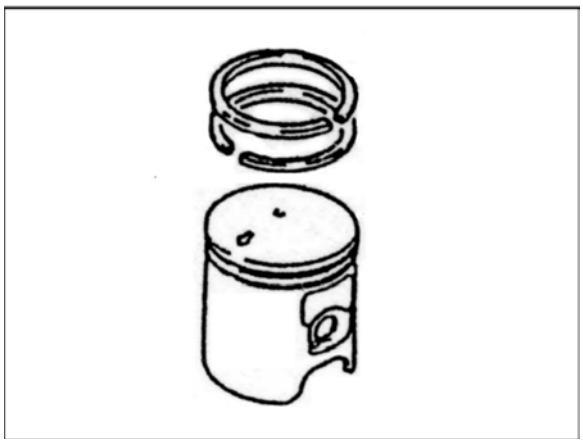
Pin bore service limit: 10.04 mm

Measure the connecting rod small end inner diameter with a small bore diameter gauge.
Service limit: 14.06 mm

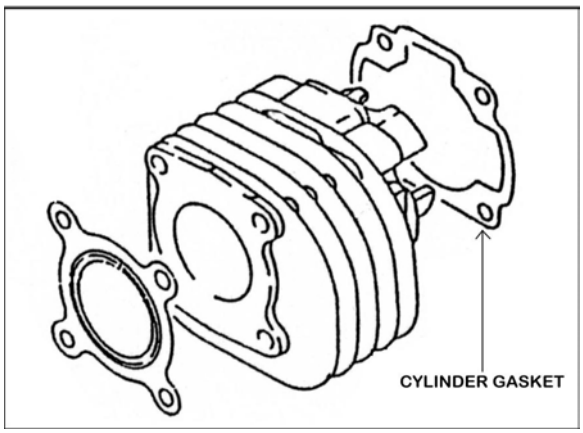


6.4 INSTALLATION

Install the piston rings with the marks facing up. Do not damage the piston rings by spreading the ends too far.



Clean the cylinder gasket surface being careful not to drop any gasket material into the crankcase.



Apply some oil to inside of the connecting rod small end.
Install the piston, piston pin and clip.
Install the piston with the arrow mark facing the exhaust pipe.
Do not align the piston pin clip end gap with the piston cutout.

Install a new cylinder gasket.
Apply a thin coat of engine oil to the piston rings and cylinder wall.
Install the cylinder, compressing the piston rings.
Replace a new cylinder head gasket.
Install the cylinder head.
Tighten the cylinder-mounting bolt.
The torque is 10-14N.m

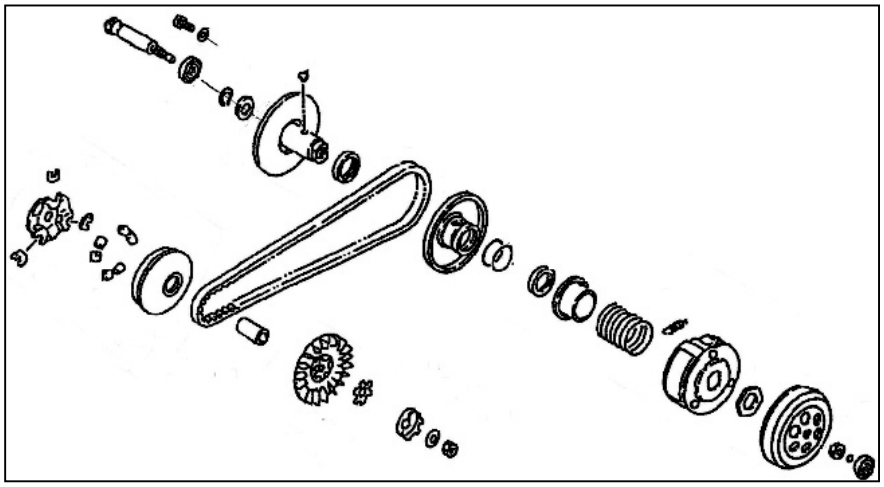
7. TRANSMISSION SYSTEM

7.1 TROUBLE SHOOTING
7.2 THE PARTS DRAWING OF TRANSMISSION SYSTEM
7.3 SHIFT MECHANISM (INCLUDE C.D.I)
7.4 AUTOMATIC CONTINUOUS VARIABLE TRANSMISSION
7.5 CONTINUOUS VARIABLE TRANSMISSION
7.6 GEAR BOX
7.7 ELECTRIC SELF-STARTER MECHANISM
7.8 KICK STARTER
7.9 DISASSEMBLY AND CHECK OF C.V.T. SYSTEM

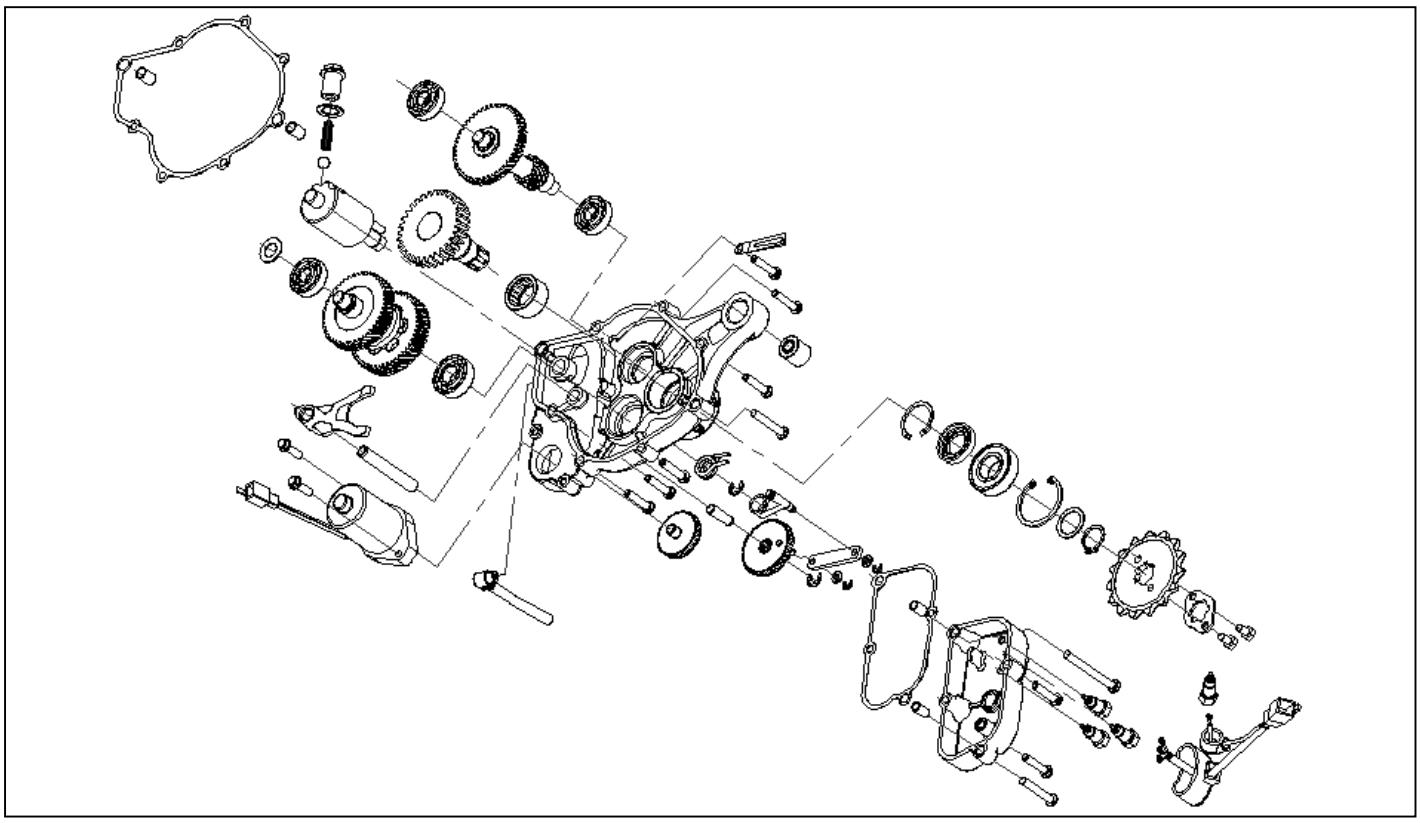
7.1 TROUBLESHOOTING

ABNORMALLY ACT IN SHIFTING AND CAN'T RESET	★ FAULTY C.D.I
	★ FAULTY SHIFT MOTOR
	★ FAULTY SENSOR (F, N1, R, N2)
	★ FAULTY SHIFT SPRING OR GEAR
CAN NOT MOVE AFTER ENGINE START	★ BELT WORN
	★ FRONT PULLEY WORN OR BROKEN
	★ LINING OF CLUTCH WORN
	★ FAULTY SHIFT SPRING
CAN NOT RUN AT HIGH SPEED	★ BELT WORN
	★ ROLLERS WORN
	★ SPRING OF REAR PULLEY IS DISTORTED
ENGINE STOP AFTER SHIFT SUCCESSFULLY	★ FAULTY C.D.I
THE FUNCTION OF SPEED LIMITED IS ABNORMAL	★ FAULTY C.D.I

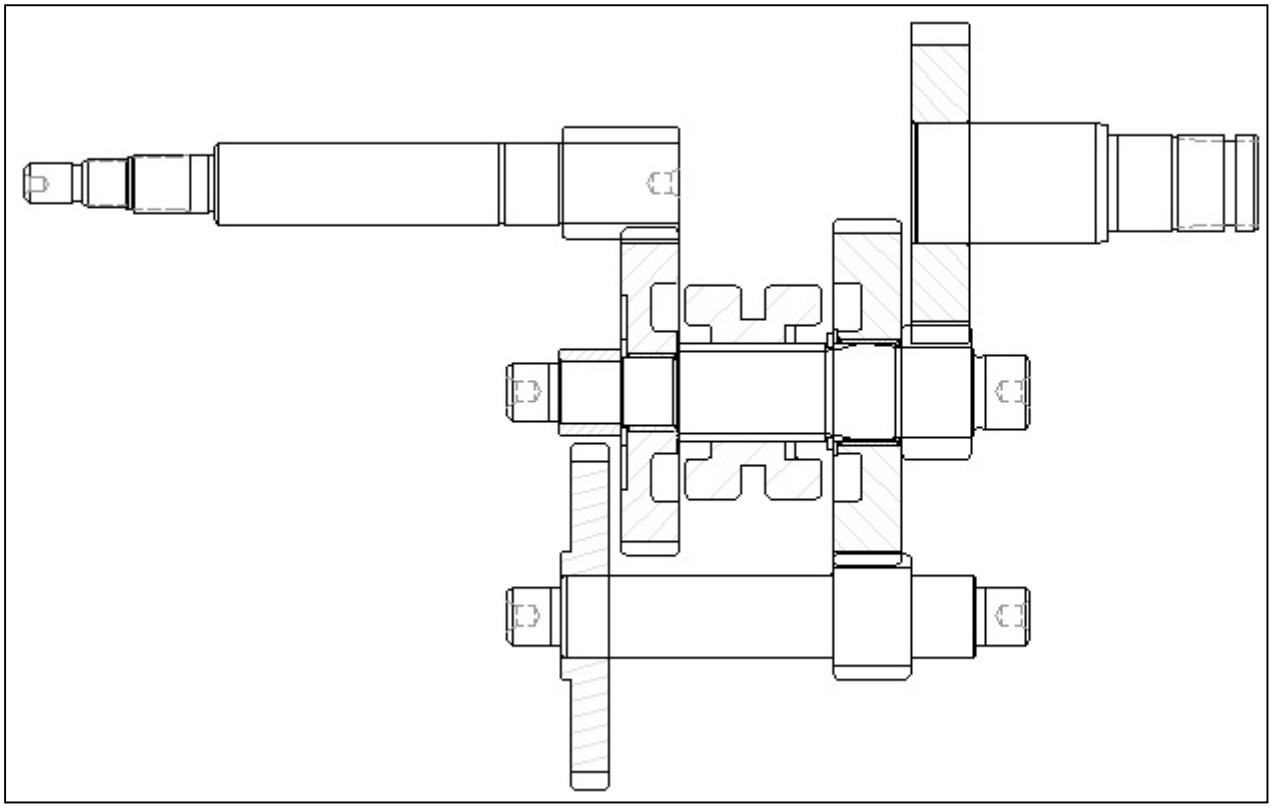
7.2 THE PARTS DRAWING OF TRANSMISSION SYSTEM



C.V.T



Shift Mechanism



Gear Box For

7.3 SHIFT MECHANISM

Sensor

Inspect wire for break or damage and check contact.
Measure sensor dimension as fig-1 after unscrew sensor.

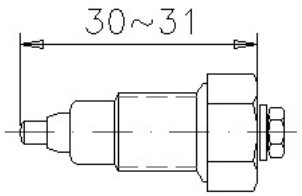
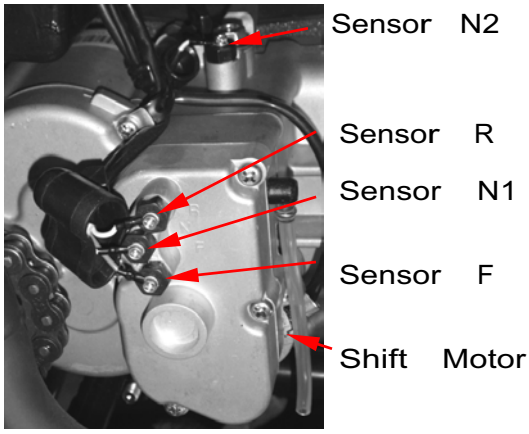


fig-1

If length is below 30mm, it must be replaced.
Smear with loctite 5699 and screw with torque 25 kgf-cm in assembly.

SERVICE LIMITS: 30 mm
TORQUE: 25 kgf-cm



Shift Spring and Gear

Remove mission side cover and other parts.
Check shift gear for wear or damage.
Measure open width of shift spring as fig-2.

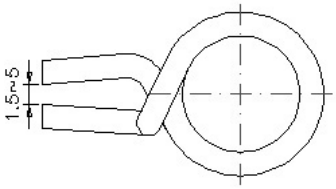
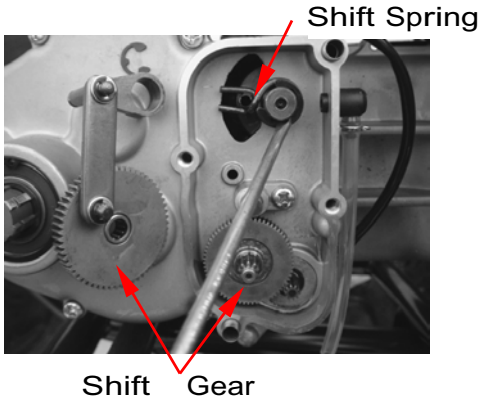


fig-2

If open width greater than 5mm, it must be replaced.

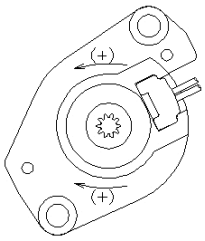
SERVICE LIMITS: 5 mm

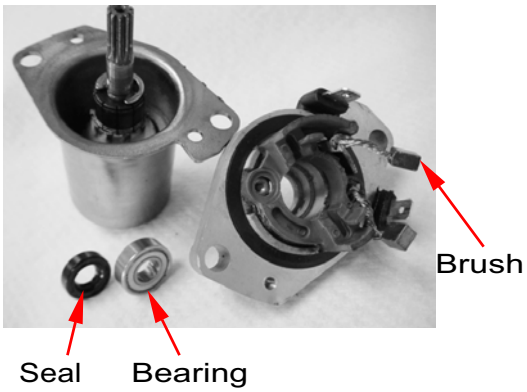


Shift Motor

Check shift motor whether it's action is normal as follow

	Voltage	Current	Torque MIN.	RPM MIN.
Loading	12V	2A	0.5kg-cm	1200RPM

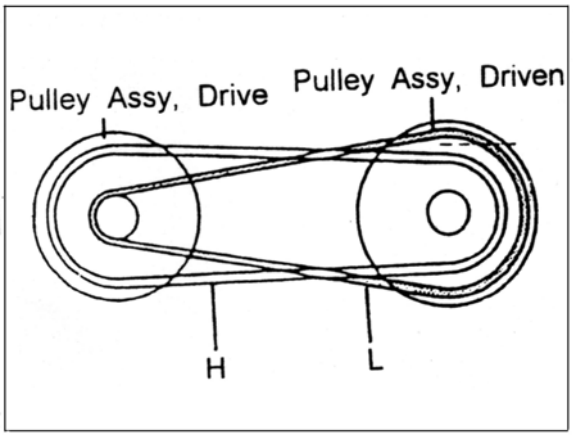




Disassembly mission side cover, parts of shift mechanism and mission cover.
Get seal and bearing after disassembly shift motor of mission cover.
Check seal and for wear or fatigue.
Replace it if necessary.

7.4 AUTOMATIC CONTINUOUS VARIABLE TRANSMISSION

This transmission is the combination of automatic centrifugal clutch and V-belt continuous variable transmission, which can change the transmission ratio automatically.

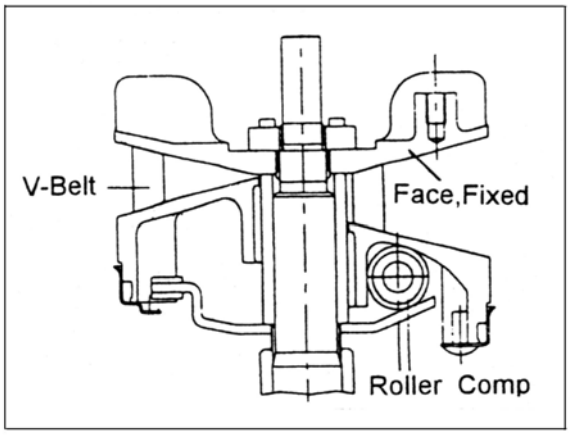


When engine speed increase, the drive pulley will be push to belt by the centrifugal force from six rollers. Then the pitch circle of belt in drive pulley will be larger.
The belt at driven pulley is forced to move to the center of shaft, then the radius of pitch circle is decreased.
The transmission ratio is therefore altered by the alteration of pitch circle's radius.
(In the drawing, "H" means high speed, "L" means low speed)

7.5 CONTINUOUS VARIABLE TRANSMISSION

V-Belt

Made of rubber fiber, resistant to head, pressure and abrasion. The inner side of the Belt is toothed.

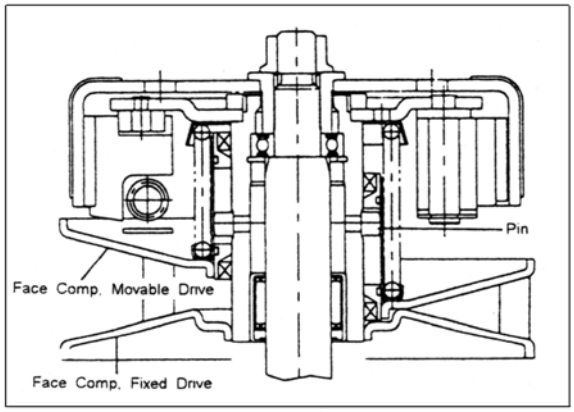


Drive Pulley

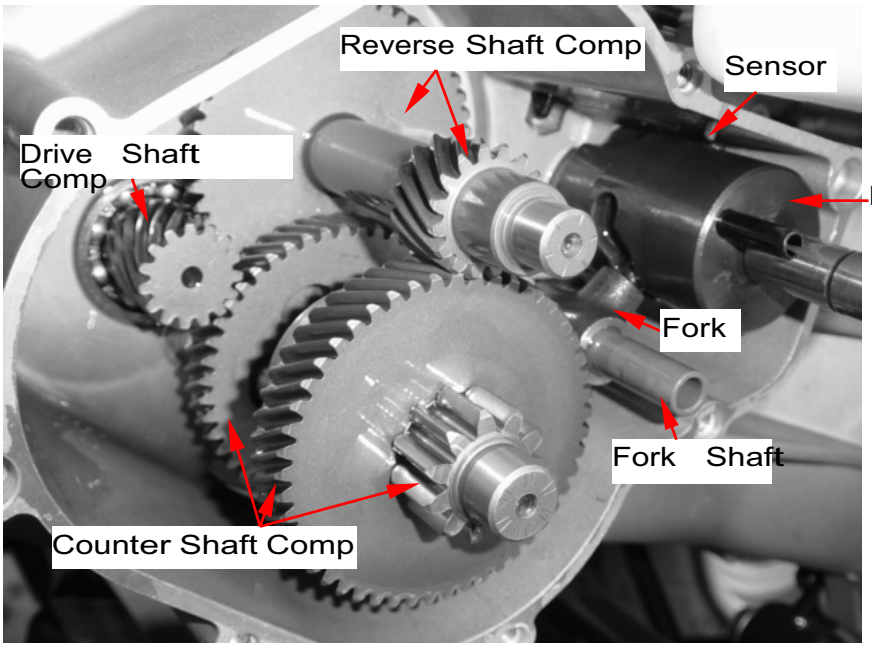
Due to the increasing engine speed, the rollers push the movable drive face by centrifugal force. Then the belt is pressed and enlarges its turning radius.
The aluminum fan is installed on the exterior of fixed drive face. It can reduce the belt temperature.

Driven Pulley

Because the revolving radius of V-Belt at the Drive End is enlarged, the Face Comp Movable Drive is squeezed out by the V-Belt at the Driven End to shorten the revolving radius.
There is a Torque Cam on the Movable Drive Face.
Torque Cam is loaded from outside. When the outside load is higher than the engine's output, the pulley of fixed shaft and belt slip to make the Movable Drive Face move along the inner side of Cam and compensate to increase to high torque (toward to low speed) and make the engine maintain smooth running with original revolution.



7.6 GEAR BOX



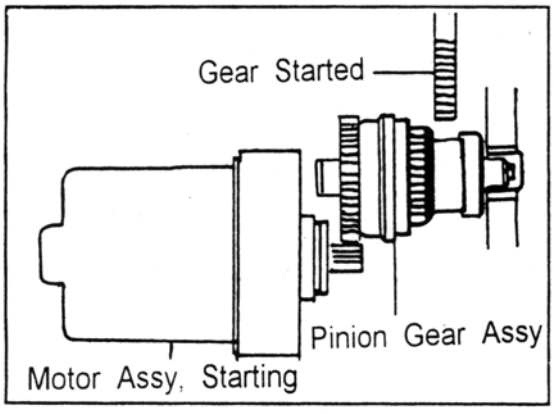
Remove mission side cover, parts of shift mechanism and mission cover.
Inspect gears for wear, scoring, chipping or break.
Replace it if necessary.

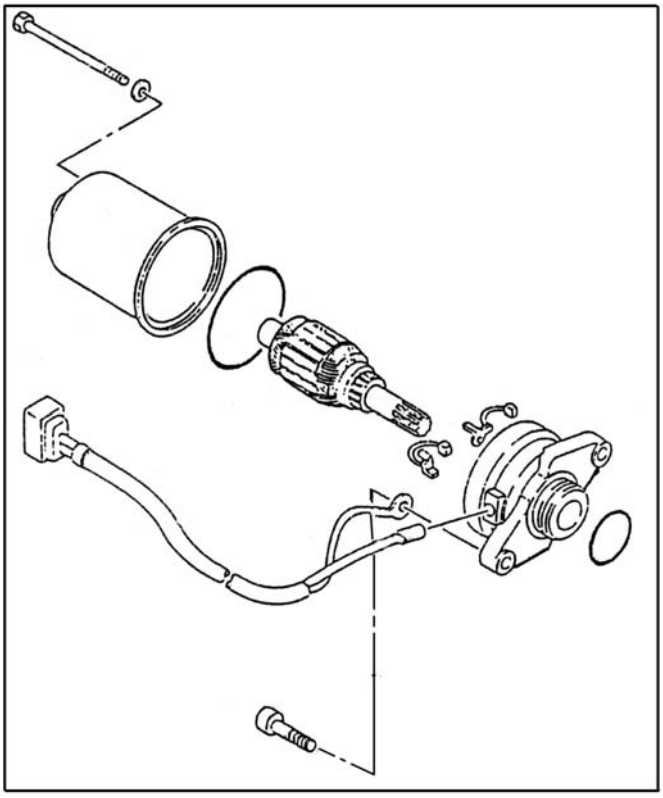
The gear ratio of front gear composition is about $\frac{47}{15} \times \frac{31}{11}$

The gear ratio of reverse gear composition is about $\frac{49}{15} \times \frac{49}{16} \times \frac{31}{11}$

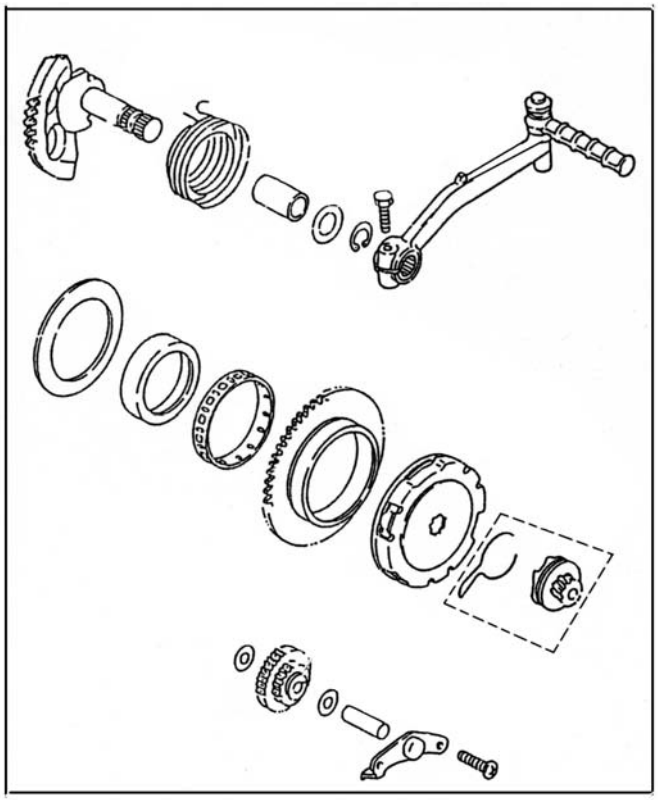
7.7 ELECTRIC SELF-STARTER MECHANISM

Starter Motor is installed on the upper side of engine.
The starter motor can act only when the left hand brake is applied.





ELECTRIC SELF-STARTER MECHANISM



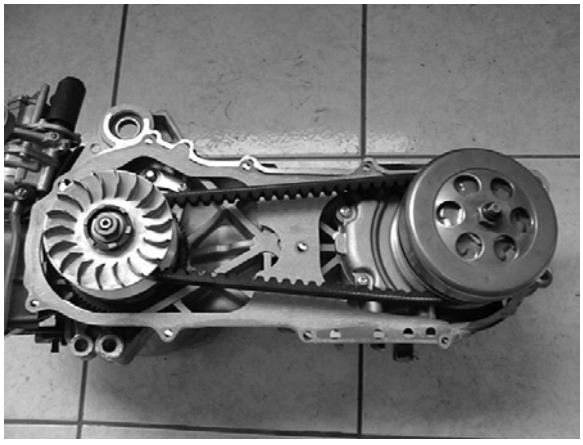
KICK STARTER

7.8 KICK STARTER

This kick-starter arm is on the left side of engine. When the kick-starter arm is kicked, the gear of start shaft will drive the kick-starter to revolve the crankshaft to start the engine.
After the engine is started, the kick-started will stop transfer the power to the kick-starter driven gear.
When the kick-starter lever is released, the kick-starter gear will go back to its original position.

7.9 DISASSEMBLY AND CHECK OF C.V.T. SYSTEM

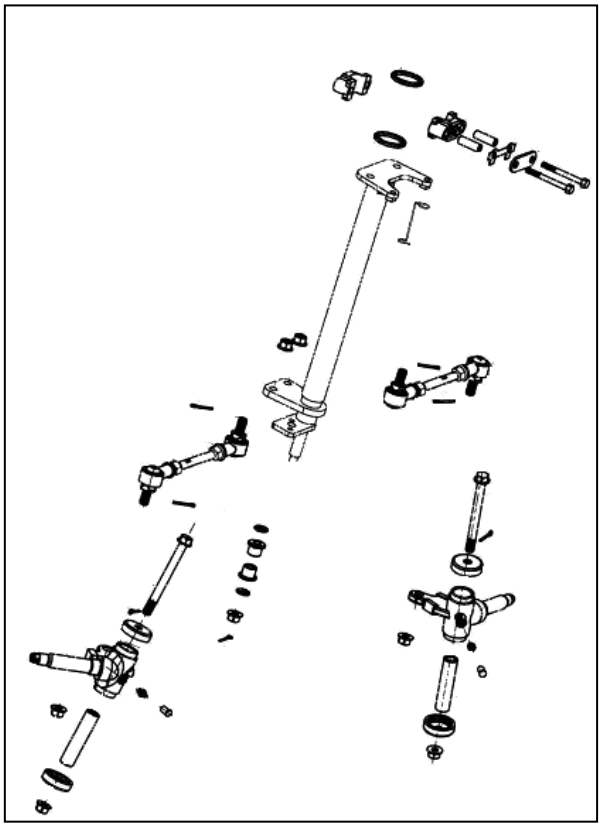
Remove the engine clutch cover, by unscrew the fixed bolts.
Check the belt for wear. If necessary, replace the belt.
Disassembly the front drive pulley, check the six rollers for wear. If necessary, replace the rollers.



8. STEERING SYSTEM

8.1 THE PARTS DRAWING OF STEERING SYSTEM
8.2 TROUBLESHOOTING
8.3 HANDLEBAR
8.4 STEERING SYSTEM

8.1 THE PARTS DRAWING OF STEERING SYSTEM



8.2 TROUBLESHOOTING

HARD STEERING	★ Faulty tire ★ Steering shaft holder too tight ★ Insufficient tire pressure ★ Faulty steering shaft bushing ★ Damaged steering shaft bushing
FRONT WHEEL WOBBLING	★ Faulty tire ★ Worn front brake drum bearing ★ Bent rim ★ Axle nut not tightened properly
STEERS TO ONE SIDE	★ Bent tie rods ★ Wheel installed incorrectly ★ Unequal tire pressure ★ Bent frame ★ Worn swing arm pivot bushings ★ Incorrect wheel alignment

FRONT SUSPENSION NOISE	★ **Loose front suspension fasteners** ★ **Binding suspension link**
HARD SUSPENSION	★ **Faulty front swing arm bushings** ★ **Improperly installed front swing arms** ★ **Bent front shock absorber swing rod**
SOFT SUSPENSION	★ **Weak front shock absorber springs** ★ **Worn or damage front swing arm bushings**

8.3 HANDLEBAR

REMOVAL

Remove the right side handlebar cover by unscrew two fix screws.

Remove the throttle lever housing on the right side handle bar.
Remove brake lever bracket assemb

Remove the handle bar switch on the left handle bar.
Remove rear brake lever bracket assembly.